

# Working Group Activity Report – 03/28/2001

## **ARAC Issue**

Transport Airplanes and Engines

## **Working Group Name**

Flight Controls Harmonization Working Group

## **Task Title**

Flight Control Systems

## **Organization**

Co-Chairs: Larry Schultz (Boeing), Pascal Traverse (Aerospatiale)

Focals: FAA – Todd Martin JAA – Richard Ward

- Participants: FAA, JAA, Boeing, Aerospatiale/Airbus, Cessna, Fairchild/Dornier, Embraer, Transport Canada, Raytheon, ALPA, Bombardier, Gulfstream

## **Task Description**

Review the current §§ 25.671 and 25.672 standards and corresponding JAR 25.671 and 25.672 standards pertaining to flight control systems, taking into account the requirements in §§ 25.1309 and 25.1329. Also review current policy including that established by special conditions issued for fly-by-wire control systems and active flight controls, and any related advisory material. Examine accumulated transport airplane service history to validate assumptions made on the probability of occurrence of system failure and consider any NTSB recommendation. In light of this review, recommend new harmonized standards, and develop related advisory material as necessary.

Expected Products : NPRM, Advisory Material

*Handout 22*

## **Status**

- Broad Agreement on 25.671 Rule and Advisory Material
- Final Draft of Material Forwarded to TAEIG
- See Enclosure for Team Member Alternate Proposals
- Team Unanimously Accepted FAA Recent Response to NTSB
- 25.672 Addressed. Recommendation: Eliminate FAA and JAA advisory material as being covered by 25.302 and 25.1309 and 25.672 will be harmonized.

## **No Plans for Next Meeting**

- Address any 25.1309 Specific Risk Issues if Necessary
- Possibly Review NPRM

## **Future Meetings – None Planned**

- Not Planned Pending 1309 Specific Risk Issue

## **Overview of 25.671 Harmonisation & Revision Activity**

- 25.671(a) Includes material from recent fly by wire certifications requiring operation in any attitude.
- 25.671(b) Revised to discourage marking alone as a desired means of ensuring correct assembly.
- 25.671(c) Negligible change.
- 25.671(c)(1) Clarifies which jamming to be excluded from “any single failure”.
- 25.671(c)(2) Added 1/1000 specific risk to numerical analysis. Clarifies which jamming to be excluded.
- 25.671(c)(3) Provides (c)(3) jam definition. Adds recognition of limitations on jam failure alleviation just prior to landing. Adds 1/1000 specific risk analysis on additional failure conditions.
- 25.671(c)(4) Highlights requirement to address runaway. Requires addressing single failure regardless of probability.
- 25.671(d) Clarifies all engine-out flight to be considered at any point in the flight. Requires flare capability.
- New-25.671(e) Adds requirement for alerting the crew if control means nears limit authority from recent fly by wire certifications.
- New-25.671(f) Adds requirement for mode annunciation from recent fly by wire certifications.

### **AC/AMJ Material:**

- Includes Current ACJs
- Provides Advisory Material for All Paragraphs of 25.671
- Defines “Normally Encountered Positions”
- Defines Criteria for “Continued Safe Flight & Landing”
- Provides Examples of Compliance for 1/1000 Specific Risk Criteria

## **Team Member Alternate Proposals**

- Raytheon, Bombardier, Airbus, Boeing, Cessna, & Transport Canada recommend using 15 kt instead of 25 kt crosswind in determination of roll and yaw control jam positions.
- Boeing recommends allowing use of other handling quality rating methods as means of compliance for Continued Safe Flight & Landing if acceptable to the certification authority.
- Bombardier & Boeing recommend an alternate definition of "single failure" which allows consideration of the likelihood of a fault propagating.
- Transport Canada recommends using more conservative "safe flight and landing" criteria to address the wide range of failure probabilities that might exist.
- Raytheon & Cessna recommend considering an exclusion for flight control disconnect failures similar to a jam failure just prior to landing.